

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claims 1-51 (cancelled)

Claim 52. (new) A method of providing a patient having impaired cartilage in an organ at a target site, with a corresponding viable cartilage, the method comprising:

- (a) providing a receptacle containing the corresponding viable cartilage having shape and size compatible with the target site in the organ in a cryopreservation solution at a temperature above a freezing temperature of the cryopreservation solution; and
- (b) cooling said corresponding viable cartilage to a temperature below said freezing temperature at a cooling rate of 0.01°C/min to 3°C/min, thereby generating a frozen corresponding viable cartilage.

Claim 53. (new) The method of Claim 52, wherein the cooling in step (b) comprises moving the receptacle along one or more consecutive temperature gradients ranging from a temperature above said freezing temperature to a temperature below said freezing temperature.

Claim 54. (new) The method of Claim 52, wherein step (b) comprises controlled initiation of seeding of freezing.

Claim 55. (new) The method of Claim 52, further comprising, after step (b):

(c) transferring the receptacle to storage at a temperature below the freezing point of said cryopreservation solution.

Claim 56. (new) The method of Claim 52, wherein the corresponding viable cartilage comprises osteochondral tissue.

Claim 57. (new) The method of Claim 55, further comprising thawing said frozen viable cartilage, wherein said frozen corresponding viable cartilage is at an initial temperature below the glass transition temperature, the thawing comprising:

(d) warming said corresponding viable cartilage from said initial temperature to an intermediate temperature being at least about said glass transition temperature or above said glass transition temperature but no more than the temperature wherein recrystallization would begin to occur at any point in the cartilage; and

(e) warming said corresponding viable cartilage from said intermediate temperature to a temperature that is at least substantially equal to the melting temperature of the solution, the warming being at a rate sufficiently high to minimize recrystallization, thereby obtaining thawed viable cartilage.

Claim 58. (new) The method of Claim 57, wherein the warming in step (d) is at a rate sufficiently slow to minimize fracture of said corresponding viable cartilage.

Claim 59. (new) The method of Claim 57, wherein the warming in step (e) is at a rate of between 50°C/min and 1000°C/min.

Claim 60. (new) The method of Claim 57, wherein said intermediate temperature is less than -10°C, or -20 to -80°C, or -40 to -80°C or -50 to -70°C.

Claim 61. (new) The method of Claim 57, wherein the warming in step (e) comprises:

- (i) removing said corresponding viable cartilage from said receptacle; and
- (ii) contacting the said viable cartilage with an environment having a temperature of 0°C or more.

Claim 62. (new) The method of Claim 61, wherein the temperature of said environment is at least 22°C, 37°C, 50°C or at least 70°C.

Claim 63. (new) The method of Claim 61, wherein said corresponding viable cartilage is connected to a pulling member and the removing of step (i) comprises pulling on said pulling member.

Claim 64. (new) A thawed viable cartilage obtainable by performing the method of Claim 57.

Claim 65. (new) The method of Claim 57 further comprising:

- (f) grafting said thawed viable cartilage in said target site.

Claim 66. (new) The method of Claim 65, wherein said organ is a joint.

Claim 67. (new) The method of Claim 65, wherein the thawed viable cartilage comprises osteochondral tissue.

Claim 68. (new) A method for the generation of a frozen viable cartilage, said method comprising:

- (a) providing a receptacle containing a viable cartilage in a cryopreservation solution at a temperature above the freezing temperature of the cryopreservation solution; and
- (b) cooling said viable cartilage to a temperature below the freezing temperature at a cooling rate of 0.01°C/min to 3°C/min, thereby generating frozen viable cartilage.

Claim 69. (new) The method of Claim 68, wherein the cooling in step (b) comprises moving the receptacle along one or more consecutive temperature gradients ranging from a temperature above the freezing temperature to a temperature below the freezing temperature.

Claim 70. (new) The method of Claim 69, wherein movement along the at least one temperature gradient in step (b) is at a velocity between 0.002 mm/sec and 5 mm/sec.

Claim 71. (new) The method of Claim 69, wherein at least one of the one or more consecutive temperature gradients in step (b) is between 0.1°C/mm to 50°C/mm.

Claim 72. (new) The method of Claim 68, wherein step (b) further comprises controlled initiation of seeding of freezing.

Claim 73. (new) The method of Claim 68, further comprising after step (b):

- (c) transferring the receptacle to storage at a temperature below the freezing point of said cryopreservation solution.

Claim 74. (new) The method of Claim 68, wherein the viable cartilage comprises osteochondral tissue.

Claim 75. (new) Frozen Cartilage obtainable by performing the method of Claim 68.

Claim 76. (new) A method for thawing a frozen viable cartilage that was frozen in a solution, the method comprising:

- (a) providing a receptacle containing the frozen corresponding viable cartilage at an initial temperature below the glass transition temperature of the solution;
- (b) warming said frozen viable cartilage from the initial temperature to an intermediate temperature being at least about the glass transition temperature or above the glass transition temperature but no more than the temperature wherein recrystallization would begin to occur at any point in the cartilage; and
- (c) warming said frozen viable cartilage from the intermediate temperature to a temperature that is at least substantially equal to the melting temperature of the solution, the warming being at a rate sufficiently high to minimize recrystallization; thereby obtaining thawed corresponding viable cartilage.

Claim 77. (new) The method of Claim 76, wherein the warming in step (b) is at a rate sufficiently slow to minimize fracture of said frozen viable cartilage.

Claim 78. (new) The method of Claim 26, wherein said warming in step (b) is at a rate of between 0.1°C/min and 200°C/min.

Claim 79. (new) The method of Claim 78, wherein the warming in step (b) is at a rate of 90°C/min.

Claim 80. (new) The method of Claim 76, wherein the warming in step (c) is at a rate of between 50°C/min and 1000°C/min.

Claim 81. (new) The method according to Claim 80, wherein the warming in step (c) is at a rate of 200°C/min.

Claim 82. (new) The method of Claim 76, wherein the intermediate temperature is less than -10°C, or -20 to -80°C, or -40 to -80°C or -50 to -70°C.

Claim 83. (new) The method of Claim 76, wherein the warming in step (c) comprises:

- (i) removing said frozen viable cartilage from said receptacle; and
- (ii) contacting the frozen viable cartilage with an environment having a temperature of 0°C or more.

Claim 84. (new) The method of Claim 83, wherein the temperature of the environment is at least 22°C, 37°C, 50°C or at least 70°C.

Claim 85. (new) The method of Claim 83, wherein said frozen viable cartilage is connected to a pulling member and the removing of step (i) comprises pulling on said pulling member.

Claim 86. (new) Thawed viable cartilage obtainable by performing the method of Claim 76.

Claim 87. (new) A method of providing a patient having impaired cartilage in an organ, with a corresponding thawed viable cartilage at a target site, the method comprising:

- (a) providing corresponding thawed viable cartilage of Claim 76 having shape and size compatible with the target site in the organ; and
- (b) grafting said corresponding thawed viable cartilage in said target site.

Claim 88. (new) The method of Claim 87, wherein said organ is a joint.

Claim 89. (new) The method of Claim 87, wherein the corresponding thawed viable cartilage comprises osteochondral tissue.